

Practical Applications of Ecosystem Service Markets

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California Biodiversity Council Meeting
December 14, 2006
Sacramento, CA

Fundamentals

□ From theory to practice

- Ecosystem services theory: water, carbon and biodiversity 'produced' by intact ecosystems have financial value
 - Fundamental principle: each unit of scientifically measurable conservation and/or restoration gets paid
 - Buyers are public or philanthropic PES, *or* outsourced compliance with air, water, or species regulation
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Water

□ Costa Rica

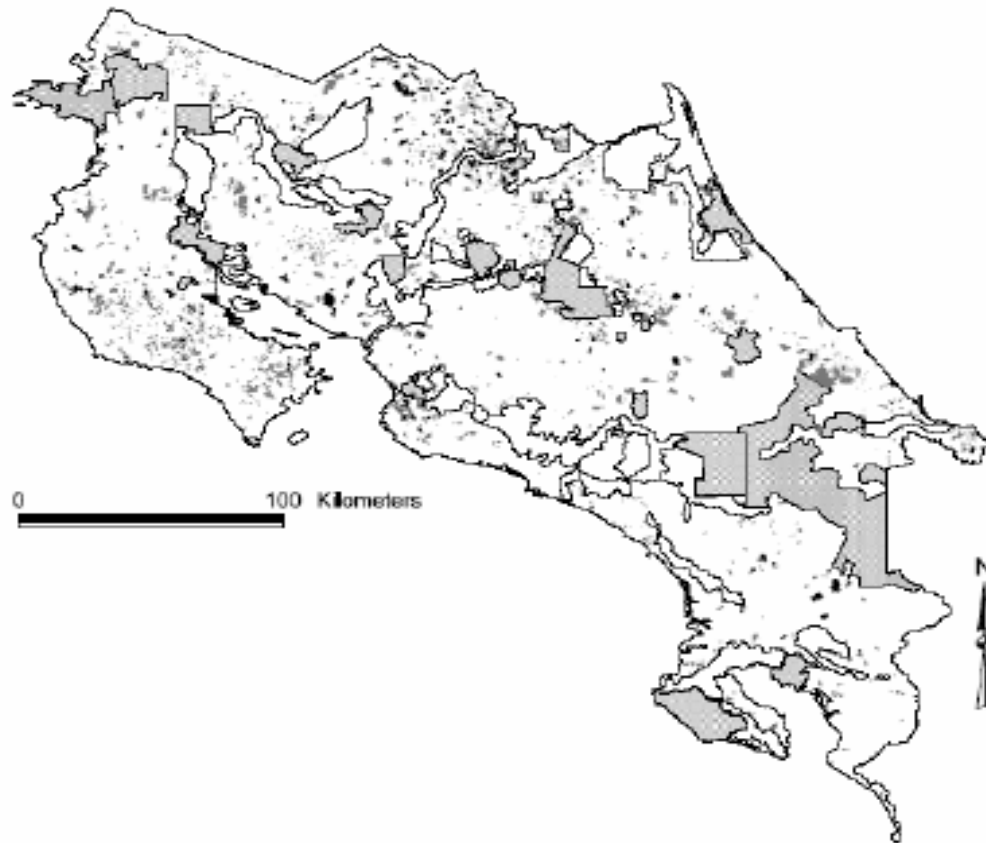
- Sellers are private land owners who receive compensation for the bundle of ecosystem services (water, carbon, biodiversity, and scenic beauty).
 - Funding from downstream buyers (hydro, utility and beer companies + World Bank) along with fossil fuels tax.
 - Owners transfer the right to the greenhouse-gas-mitigation potential of the parcel to the national forestry financing ministry.
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Water (2)

□ Costa Rica (con't.)

- *Forest conservation contracts*: protect existing forest for five years. No land cover change is allowed. US\$210 per hectare in equal installments across the five-year agreement.
 - *Reforestation contracts*: plant trees on agricultural or other abandoned land and to maintain the plantation for 15 years. Reforestation contracts pay US\$537/ha with 50% paid the first year, 20% the second, and 10% for the next three years.
 - *Sustainable forest management contracts*: prepare a “sustainable logging plan” for low-intensity logging. US\$327/ha total: same payment schedule as reforestation.
 - 375,000 ha enrolled through 2003
 - Because payments are fixed, lowest profitability lands are enrolled.
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Water (3)



Water (4)

■ Mexico

- National Water Commission (Comisión Nacional del Agua, CNA) priority areas for recharging important aquifers; program gives preference for sites that provide watershed services for downstream communities of more than 5000 people.
 - Satellite imagery used to obtain a baseline of forest cover, letter of agreement for five years. "At the end of each year, if the forest, cover is maintained, they get paid."
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Water (5)

■ Mexico

- Price paid to the land owner: corn production opportunity cost of use of the land *plus* hydrologic benefits from relationship between forest type and water outcome expected. Thus, cloud forests receive higher payments of \$400 Mexican pesos/ha (~US\$36) and temperate forests receive \$300 Mexican pesos/ha (~US\$30).
 - 2003: 192 million pesos (\$19 million dollars) for maintaining forest cover on some 126,000 hectares
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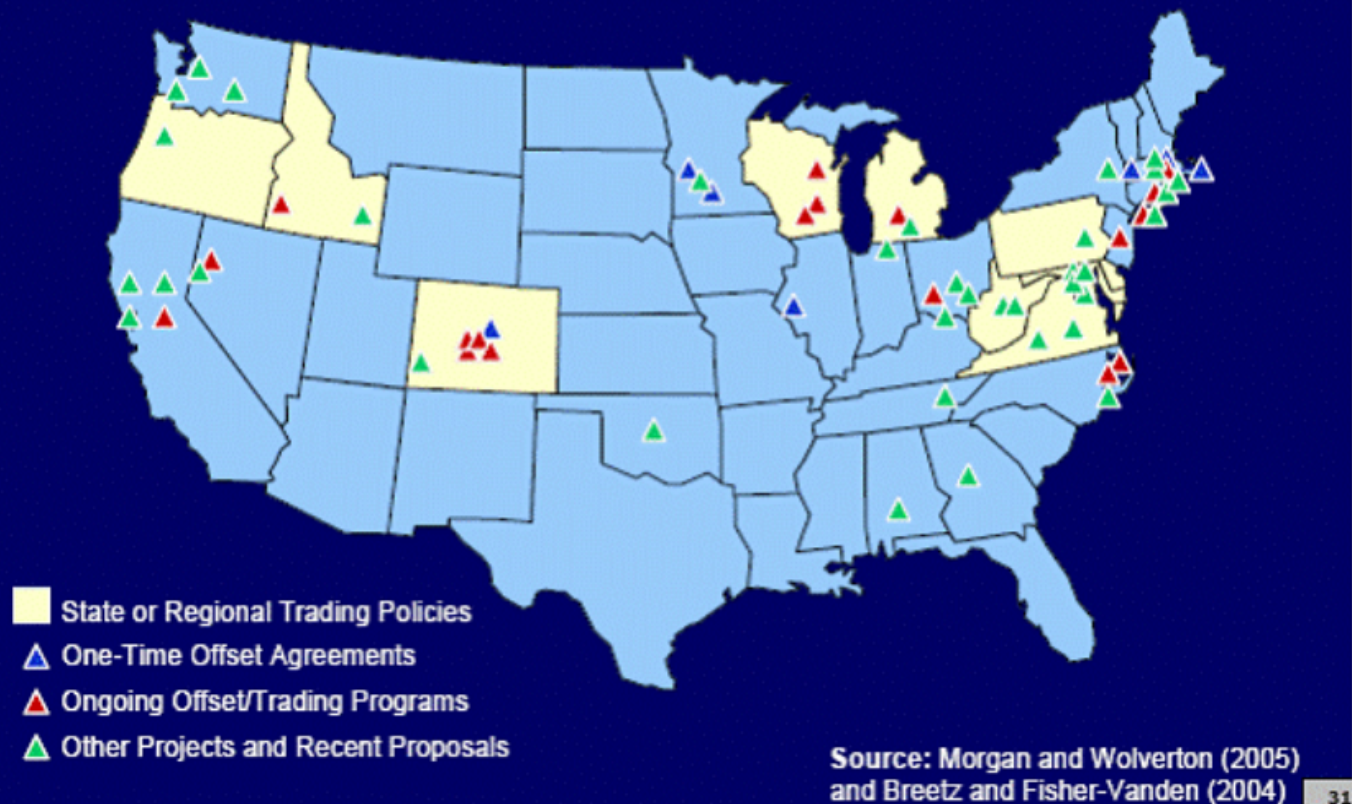
Water (6)

- Australia: Hunter River Salinity Trading
 - New South Wales Dept. of Environment and Conservation
 - Manage saline water discharge from mines and power plants
 - Mechanism:
 - Twenty-two dischargers hold a total of 1,000 salinity credits.
 - During high flow conditions, each credit allows the discharger to either discharge up to 0.1% of the Total Allowable Discharge or sell the credit to another participating facility
 - During low flow conditions no discharges are allowed and during flood conditions discharges are unrestricted.
 - Two-hundred of the 1,000 credits expire every two years and 200 new credits are auctioned to the highest bidders.
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Water (7)

- US Water Quality trading
 - Total Maximum Daily Load (TMDL)
 - Nutrients and sediments
 - Point source (ie POTW's) and non-point source participants.
 - Variations
 - National Pollutant Discharge Elimination System (NPDES)
 - Partnership for Safe Drinking Water (Catskills)
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Water Quality Trading Activity



Water (8)

- ❑ Clean Water Act (Section 404):
Mitigation Banking
 - Avoidance and minimization, then mitigation
 - Ecological success criteria, deed restriction and financial assurance
 - Credit ratio (currency value) and service area (watershed)
 - Over 500 banks now in operation
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Water (9)

- ❑ North Carolina Ecological Enhancement Program
 - Wetland *and* Stream restoration
 - Consolidated outsourced compliance for aquatic resource impacts
 - First two years of operations: more than \$1.9 billion in road construction across the state without a single project delay because of a lack of mitigation.
 - 400 stream and wetland restoration projects
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Water (10)

☐ Other markets

■ Lake Tahoe 'coverage' markets

- ☐ Tahoe Regional Planning Agency/California Tahoe Conservancy
- ☐ Impervious surface removal to facilitate improved Tahoe quality and clarity
- ☐ \$6.50 - \$12.00 ft. charged for 'excess' coverage then offsets purchased

■ Flood Storage Credits

- ☐ Sacramento Flood Control Agency
 - ☐ Flood storage 'rental' as liability release
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Carbon

☐ Voluntary Markets

■ Afforestation and Reforestation

☐ Powertree

- Utilities – \$3M - 1.6MT CO₂

☐ Carbon Neutral Company

- Forestry and Tech offsets

☐ Oregon Climate Trust

- \$5MUS – 4.9MT CO₂ offsets

☐ Greenfleet: 2M trees/AU motorist offset

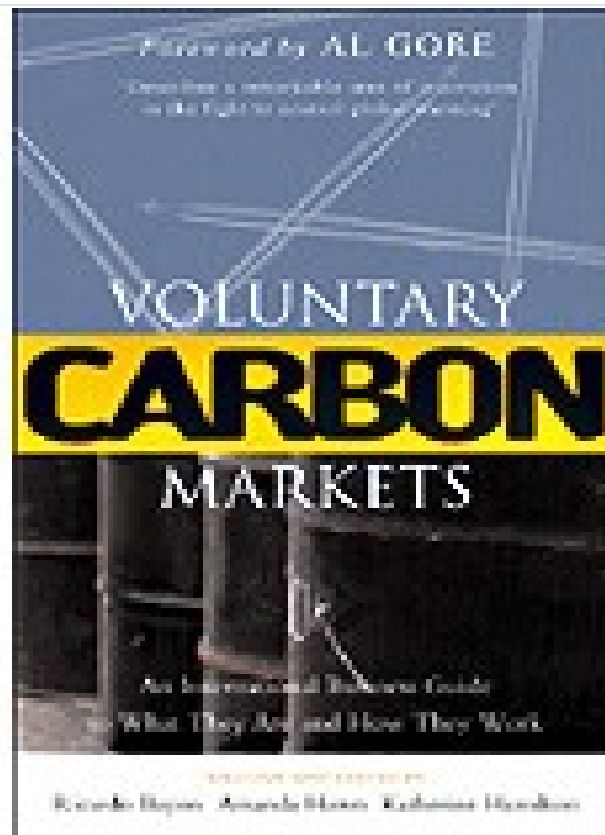
- \$40AU – 17 trees – 4.3T CO₂

☐ Green-e: Certified carbon REC's

■ Even plankton!

☐ Planktos

Carbon (2)



Carbon (3)

- ☐ European Union Emissions Trading Scheme
 - ☐ Kyoto: CDM and JI
 - ☐ New South Wales Greenhouse Gas Abatement
 - ☐ Chicago Climate Exchange
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Carbon (4)

☐ California Carbon

- Global Warming Solutions Act (AB32) gives California Air Resources Board lead in strategy for reducing the state's greenhouse gas emissions: 1990 levels by 2020
 - January 2008 target for emissions reporting rules and complete plan by January 2011, with enforcement following in 2012
 - CCAR – California Climate Action Registry
 - ☐ Forestry protocol
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Carbon (5)

- Forestry Protocol (con't.)
 - Permanent easement
 - Native forest, 100+ acres
 - Reforestation, Conservation-based forest management and Conservation all “count”
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Carbon (6)

- ❑ ***Conservation-based Forest Management:*** Forest projects that are based on the commercial or noncommercial harvest and regeneration of native trees and employs natural forest management practices
 - ❑ ***Reforestation:*** Forest projects that are based on the restoration of native tree cover on lands that were previously forested, but have been out of tree cover for a minimum of ten years
 - ❑ ***Conservation:*** Forest projects that are based on specific actions to prevent the conversion of native forests to a non-forest use, such as agriculture or other commercial development
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Biodiversity

- Victoria, Australia: Bushtender and Biobanking
 - Bushtender: launched 2001 pilot
 - 5000 ha for native vegetation management
 - Ecotender: \$500K AU pilot
 - Auction approach resulted in high participation and private landowner information disclosure
 - Lower cost per unit of protection
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Biodiversity (2)

- New NSW Legislation: Biobanking
 - Biodiversity Benefits Index ranks landowner bids in terms of high quality habitat maintenance
 - BioBanking allows 'biodiversity credits' to be generated by landowners who commit to enhance and protect biodiversity values on their land.
 - Credits will be tradable
 - Fundamental methodology still under development; to be implemented in 2007
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Biodiversity (3)

☐ Conservation Banking

■ Speciesbanking.com

- ☐ Will work with RIBITS (EPA database)
 - ☐ Palmer Hough (EPA) and Kelly Burks-Copes (USACE) are on steering committee
 - ☐ RIBITS has regulator orientation, Speciesbanking.com has investor and landowner orientation
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Expanding the Pool of Conservation Finance

- ❑ The Sustainable Land Fund (SLF): a portfolio of landscape scale properties containing critical environmental features that have significant financial value gained through restoration and sustainable land use practices.
 - ❑ The SLF will make use of new market mechanisms and incentive programs that assign value to ecosystem services and reward both conservation and restoration actions.
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SLF (2)

□ Components of value:

- Wetland & Stream Mitigation Banking
 - Conservation (endangered species) Banking
 - Conservation Finance (e.g. conservation easements)
 - Sustainable (Certified) Timber and Agriculture
 - Water quality and in-stream flow transactions
 - Recreation – Hunting, Fishing, Eco-Tourism
 - Transfer of Development Rights (TDR)
 - Carbon Sequestration
 - Limited Conservation Development
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SLF (3)

□ Partners

■ Fred Danforth

□ Founder, Capital Resource Partners

■ Dixon Harvey

□ CEO, Environmental Banc & Exchange

■ Nick Dilks

□ former VP Real Estate, the Conservation Fund

■ Adam Davis

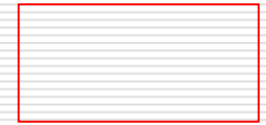
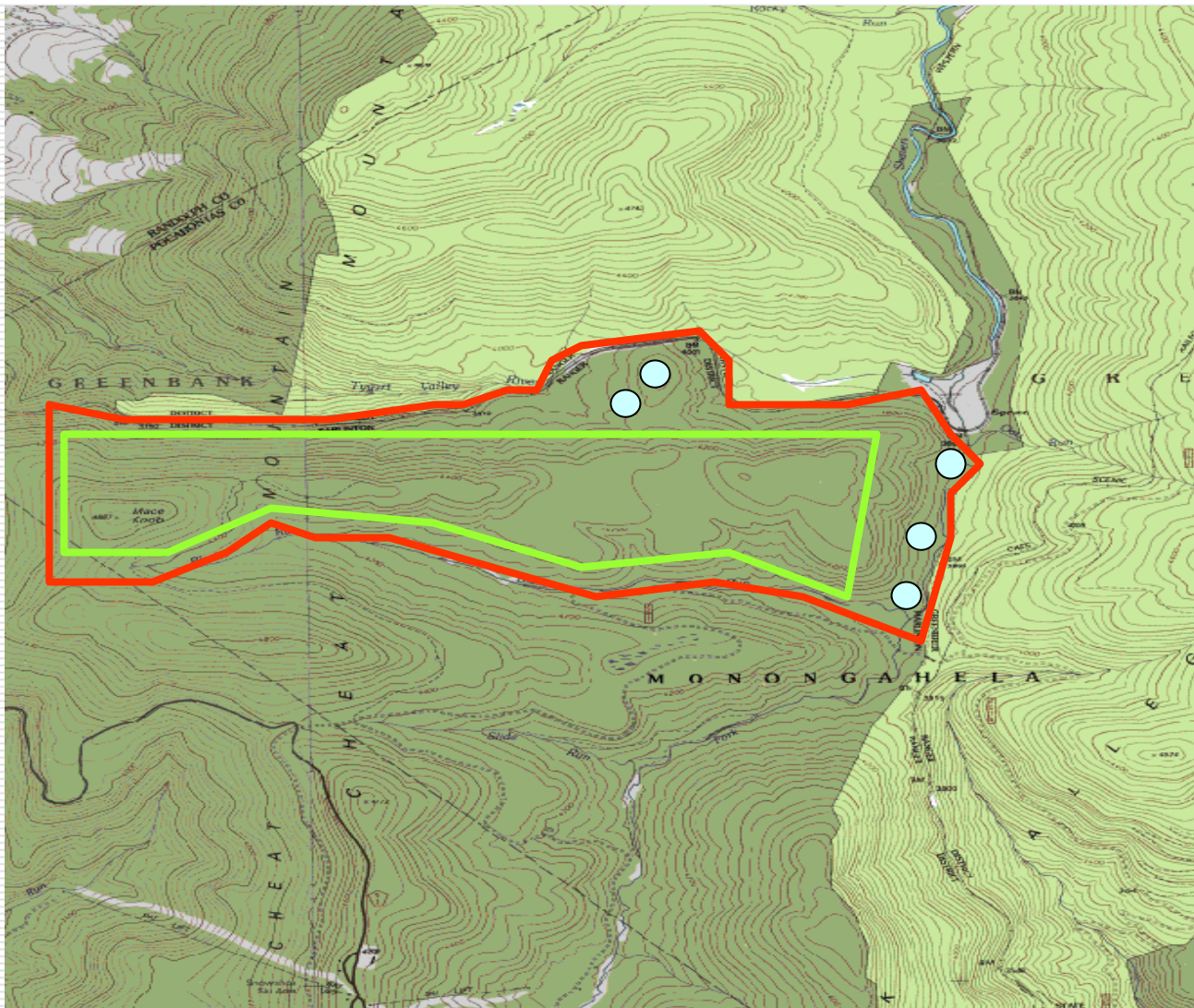
□ co-founder, Ecosystem Marketplace

Snowshoe, WV

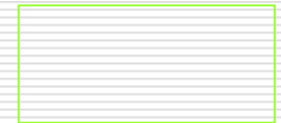


Snowshoe, WV

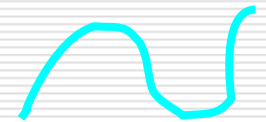




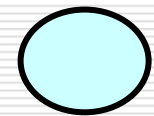
Property



Conservation Bank



Shaver's Fork River



Limited Development Sites

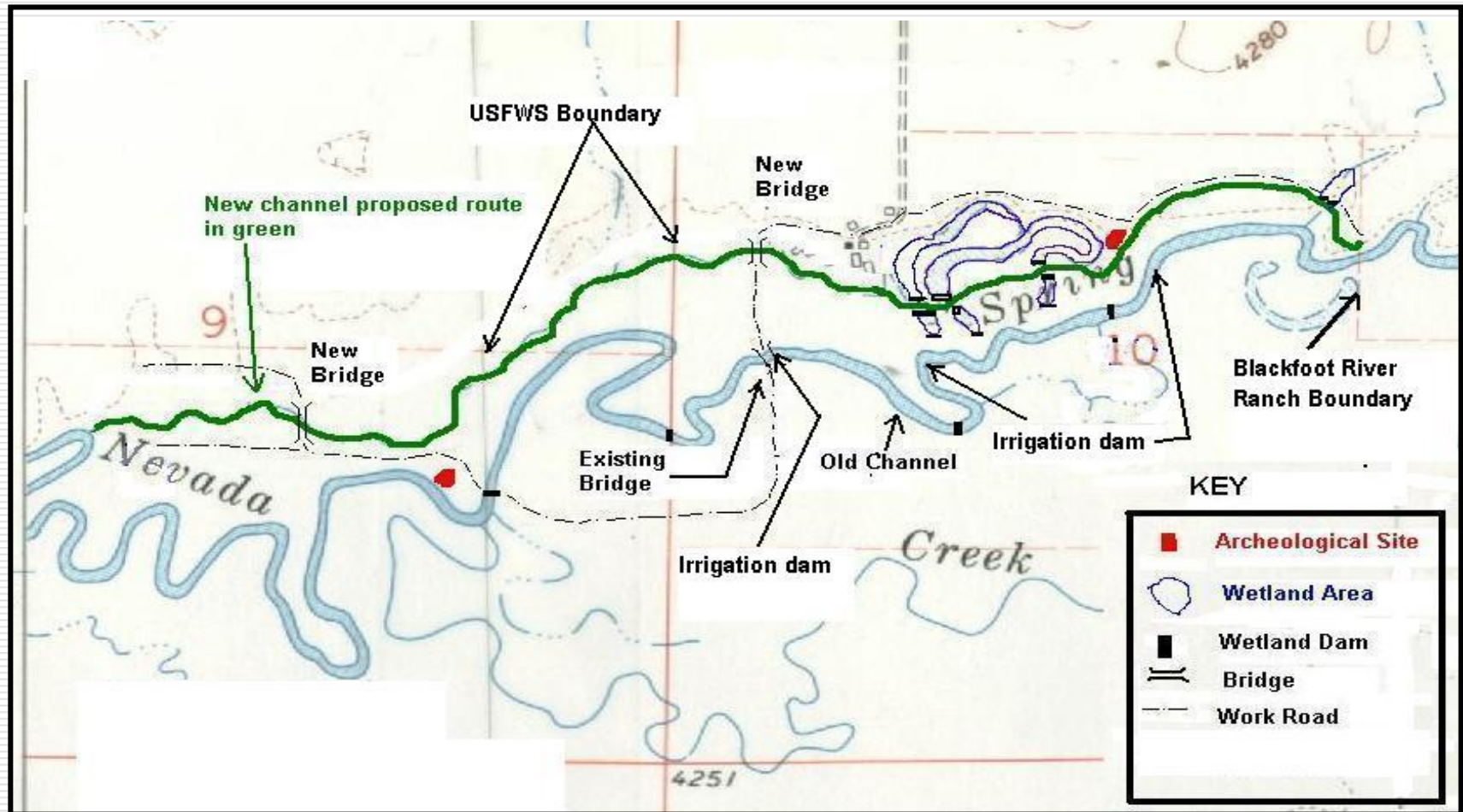
Snowshoe, WV

Components of Value:

- ❑ Habitat/Conservation Banking – Cheat Mountain salamanders and WV flying squirrels are on the property.
- ❑ Timber Management – The property lies in West Virginia's premier hardwood region (cherry, hard maple and oak).
- ❑ Limited Development – Strong second home development market.
- ❑ Conservation Finance - The property is within the acquisition boundary of the Monongahela NF TNC would assist SLF in pursuit of these and other possible funding sources.



SLF Example ~ Nevada Spring Creek



SLF Example: Nevada Spring Crk.

Before



After



SLF Approach

- ❑ Unlocking return on investment from conservation and restoration action on private property is a necessity to incentivize large scale protection of important ecosystems.
 - ❑ The growing recognition of the importance of these natural assets and of their increasing scarcity is a fundamental driver that is affecting financial values now.
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Resources

- ❑ www.ecosystemmarketplace.com
 - ❑ www.mercadosambientales.com
 - ❑ www.katoombagroup.org
 - ❑ www.slfusa.com
 - ❑ From Walden to Wall Street, James Levitt, Island Press, 2006
 - ❑ The New Economy of Nature, Daily and Ellison, Island Press, 2005
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